इंटरनेट मानक

## Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 279 (1981): Galvanized steel wire for telegraph and telephone purposes [MTD 4: Wrought Steel Products]

"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

**IS : 279 - 1981**
**( Reaffirmed 1997 )**

REAFFIRMED

2004

# *Indian Standard*

# SPECIFICATION FOR GALVANIZED STEEL WIRE FOR TELEGRAPH AND TELEPHONE PURPOSES

## *( Third Revision )*

---

Second Reprint OCTOBER 2000

UDC 669.14-426:669.586:621.394/.395

© *Copyright* 1981

**BUREAU OF INDIAN STANDARDS**
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

**Gr 3**

*December* 1981

# AMENDMENT NO. 2 JUNE 2001
# TO
# IS 279 : 1981 SPECIFICATION FOR GALVANIZED STEEL WIRE FOR TELEGRAPH AND TELEPHONE PURPOSES

*( Third Revision )*

( *Page* 4, *clause* 4.3 ) — Substitute the following for the existing clause:

'4.3 Zinc ingots used for galvanizing shall conform to any of the grades specified in IS 209 : 1992 Zinc ingot or IS 13229 : 1991 Zinc for galvanizing.'

( MTD 4 )

Reprography Unit, BIS, New Delhi, India

# AMENDMENT NO. 1 MARCH 1984

# TO

# IS:279-1981 SPECIFICATION FOR GALVANIZED STEEL WIRE FOR TELEGRAPH AND TELEPHONE PURPOSES

*(Third Revision)*

## Corrigendum

(*Page* 5, *Table* 1, *col* 5) - Substitute 'N' *for* 'kg'.

(SMDC 5)

Reprography Unit, BIS, New Delhi, India

**IS : 279 - 1981**
**( Reaffirmed 1997 )**

# *Indian Standard*

# SPECIFICATION FOR GALVANIZED STEEL WIRE FOR TELEGRAPH AND TELEPHONE PURPOSES

## *( Third Revision )*

---

Wrought Steel Products Sectional Committee, SMDC 5

| *Chairman* | *Representing* |
|---|---|
| Dr U. N. Bhrany | Modella Steel & Alloys Ltd, Bombay |
| *Members* | |
| Shri S. Banerjee | Steel Re-Rolling Mills Association of India, Calcutta |
| Shri A. M. Biswas | National Test House, Calcutta |
| Shri K. L. Barui ( *Alternate* ) | |
| Shri S. M. Dutta | Durgapur Steel Plant ( SAIL ), Durgapur |
| Dr P. K. Saha ( *Alternate* ) | |
| Shri S. C. Dey | Central Boilers Board |
| Director ( M & C ), RDSO | Ministry of Railways |
| Joint Director ( Met ), RDSO ( *Alternate* ) | |
| Shri A. K. Jee | Ministry of Defence ( DGI ) |
| Shri V. I. Ramaswamy ( *Alternate* ) | |
| Joint Director ( Wagon )-II, RDSO | Ministry of Railways |
| Joint Director ( Iron & Steel ), Railway Board ( *Alternate* ) | |
| Shri M. N. Khanna | Bhilai Steel Plant ( SAIL ), Bhilai |
| Shri S. Krishnamurthy ( *Alternate* ) | |
| Shri C. K. Kuriakose | Hindustan Shipyard Ltd, Visakhapatnam |
| Shri N. S. R. V. Raju ( *Alternate* ) | |
| Dr D. M. Lakhiani | The Indian Iron & Steel Co Ltd, Burnpur |
| Shri T. K. Datta ( *Alternate* ) | |
| Shri T. Mukherjee | The Tata Iron & Steel Co Ltd, Jamshedpur |
| Shri A. N. Mitra ( *Alternate* ) | |
| Shri P. K. Munshi | Ministry of Railways |
| Shri Satish Muranjan | Special Steels Ltd, Bombay |
| Shri M. R. Doctor ( *Alternate* ) | |
| Shri K. R. Narasimhan | The Metal Box Co of India Ltd, Calcutta |
| Shri A. G. Shrimankar ( *Alternate* ) | |
| Shri M. K. Paramanik | Iron & Steel Control, Calcutta |
| Shri B. K. Dutta ( *Alternate* ) | |

( *Continued on page* 2 )

© *Copyright* 1981
BUREAU OF INDIAN STANDARDS
This publication is protected under the *Indian Copyright Act* ( XIV of 1957 ) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

( *Continued from page* 1 )

| *Members* | *Representing* |
|---|---|
| Shri Raghubir Singh | National Metallurgical Laboratory ( CSIR ), Jamshedpur |
| Representative | Association of Indian Engineering Industry ( Steel Tubes Division ), New Delhi |
| Representative | Federation of Engineering Industry in India, New Delhi |
| Representative | Steel Authority of India ( R & D ), Ranchi |
| Shri R. N. Saha | Directorate General of Supplies & Disposals, New Delhi |
| Shri D. K. Paul ( *Alternate* ) | |
| Shri K. R. Sangameswaran | Rourkela Steel Plant ( SAIL ), Rourkela |
| Prof S. S. Pani ( *Alternate* ) | |
| Shri A. Srinivasula | Bharat Heavy Electricals Ltd, Secunderabad |
| Shri A. K. Mittal ( *Alternate* I ) | |
| Shri U. Mohan Rao ( *Alternate* II ) | |
| Shri D. Srinivasan | Joint Plant Committee, Calcutta |
| Shri B. P. Ghosh ( *Alternate* ) | |
| Shri K. V. Subba Rao | Mukand Iron & Steel Works Ltd, Bombay |
| Shri R. V. Parekh ( *Alternate* ) | |
| Shri S. G. Tudekar | Bokaro Steel Plant ( SAIL ), Bokaro |
| Shri K. S. Vaidyanathan | M. N. Dastur & Co Pvt Ltd, Calcutta |
| Shri S. K. Basu ( *Alternate* ) | |
| Shri C. R. Rama Rao, Director ( Struc & Met ) | Director General, ISI ( *Ex-officio Member* ) |

*Secretary*

Shri V. K. Jain
Deputy Director ( Metals ), ISI

## Panel for Steel Wires for General Engineering Purposes, SMDC 5/P-38

| | |
|---|---|
| ***Convener*** | |
| Shri R. C. Mahajan | Indian Steel and Wire Products, Ltd, Jamshedpur |
| ***Members*** | |
| Additional Chief Engineer | P & T Department, Jabalpur |
| Shri K. R. Banerjee | Hindustan Wires Ltd, Calcutta |
| Shri S. K. Das | Usha Martin Black Ltd, Ranchi |
| Shri M. M. L. Khullar | Modi Steels, Modinagar |
| Shri Satish Muranjan | Specials Steel Ltd, Bombay |
| Shri M. R. Doctor ( *Alternate* ) | |
| Shri J. P. Patel | Tensile Steels Ltd, Vadodara |
| Shri K. C. Tripathi | Ministry of Defence ( DGI ) |

# *Indian Standard*

# SPECIFICATION FOR GALVANIZED STEEL WIRE FOR TELEGRAPH AND TELEPHONE PURPOSES

## *( Third Revision )*

## 0. FOREWORD

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 15 September 1981, after the draft finalized by the Wrought Steel Products Sectional Committee had been approved by the Structural and Metals Division Council.

**0.2** This standard was first published in 1951 and was revised in 1961 and in 1972. While reviewing the standard in the light of the experience gained during these years, the Sectional Commitee decided that this standard be further revised. In this revision the following main modifications have been made:

a) Load is specified in terms of newtons ( N ) in alignment with the adoption of the SI units both nationally and internationally,

b) Sampling requirements have been modified, and

c) Reference has been given to the latest standards available for supply of material ( IS : 8910-1978* ) and for chemical composition ( IS : 7887-1975† ).

**0.3** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960‡. The number of significant places retained in the rounded off value should be same as that of the specified value in this standard.

---

*General technical delivery requirements for steel and steel products.

†Mild steel wire rod for general engineering purposes.

‡Rules for rounding off numerical values ( *revised* ).

## 1. SCOPE

**1.1** This standard covers the requirements for two grades of galvanized steel wires ( *see* Table 1 ) suitable for use as:

a) telegraph and telephone line wires, and

b) binding and jointing wires for telegraph and telephone wires.

## 2. TERMINOLOGY

**2.1** For the purpose of this standard, the definitions given in IS : 1956 ( Part V )-1976* shall apply.

## 3. SUPPLY OF MATERIAL

**3.1** General requirements relating to the supply of galvanized steel wire for telegraph and telephone purposes shall conform to IS : 8910-1978†.

## 4. MANUFACTURE

**4.1** Wire shall be drawn from the wire rods conforming to IS : 7887-1975‡.

**4.2** The wire shall be drawn in a continuous piece of specified diameter as given in Table 1.

**4.3** The wire shall be galvanized with zinc conforming to IS : 209-1966§ and shall have properties as given in Table 1.

## 5. CHEMICAL COMPOSITION

**5.1** The requirements for chemical composition for the wires shall conform to those given in IS : 7887-1975‡.

## 6. PHYSICAL PROPERTIES

**6.1** The physical and electrical properties of the wire shall be in accordance with those given in Table 1.

**6.2 Wrapping Test** — Wrapping test shall be conducted in accordance with IS : 1755-1961‖. The wire, when wrapped eight times round its own diameter and subsequently unwrapped, shall withstand the test without breaking or cracking.

---

*Glossary of terms relating to iron and steel: Part V Bright steel bar and steel wire ( *first revision* ).

†General technical delivery requirements for steel and steel products.

‡Specification for mild steel wire rod for general engineering purposes.

§Specification for zinc ( *second revision* ).

‖Method for wrapping test of wire.

## TABLE 1 PHYSICAL PROPERTIES OF TELEGRAPH AND TELEPHONE WIRES

( *Clauses* 1.1, 4.2, 4.3, 6.1, 6.3, 6.5 *and* 7.1 )

| DIAMETER | | | MASS* | BREAKING LOAD* *Min* | RESISTANCE OF WIRE AT 27°C†, *Max* | |
|---|---|---|---|---|---|---|
| *Nom* | *Min* | *Max* | | | Grade 1 | Grade 2 |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| mm | mm | mm | kg/km | kg | Ω/km | Ω/km |
| 1·50 | 1·46 | 1·54 | 13·8 | 660 | 71·4 | 87·7 |
| 1·80 | 1·76 | 1·84 | 19·9 | 940 | 49·5 | 60·9 |
| 2·0 | 1·95 | 2·05 | 24·7 | 1160 | 40·1 | 49·3 |
| 2·12 | 2·07 | 2·17 | 27·6 | 1305 | 35·7 | 43·9 |
| 2·50 | 2·44 | 2·56 | 38·3 | 1815 | 25·7 | 31·6 |
| 2·80 | 2·73 | 2·87 | 48·3 | 2295 | 20·5 | 25·2 |
| 3·55 | 3·46 | 3·64 | 77·3 | 3660 | 12·7 | 15·7 |
| 4·0 | 3·90 | 4·10 | 98·0 | 4680 | 10·0 | 12·3 |
| 5·60 | 5·50 | 5·70 | 192·3 | 9170 | 5·1 | 6·3 |

*The values are based on nominal diameter of wire.

†The values are based on mass of nominal sizes of wire.

**6.3 Tensile Test** — The breaking load of the wire, when tested in accordance with IS : 1521-1972*, shall not be less than the values given in Table 1.

**6.4 Coating Test** — The galvanized coating of steel wire shall conform to the requirements of heavy coating as given in IS : 4826-1968†.

**6.5 Resistance Test** — The electrical resistance in ohm per kilometre of the test sample multiplied by $\frac{W}{K} \times C$ shall be taken as the resistance per kilometre of the wire at 27°C and shall not exceed the maximum resistance values given in Table 1 for the two grades of wire.

In this formula, the symbols shall have the following meanings assigned to them:

$W$ = Mass of test sample in kg/km,

$K$ = Mass ( based on nominal size ) in kg/km ( *see* Table 1 ), and

$C$ = multiplier constant for correcting to 27°C ( *see* Appendix A ).

---

*Method for tensile testing of steel wire ( *first revision* ).

†Specification for galvanized coatings on round steel wires.

## 7. TOLERANCES

**7.1** The permitted tolerances regarding the diameter of each piece or coil shall conform to the requirements given in Table 1.

## 8. FREEDOM FROM DEFECTS

**8.1** All finished wire shall be well and cleanly drawn to the dimensions specified. It shall have a smooth and uniform galvanized coating and shall be sound and free from splits; surface flaws; rough, jagged and imperfect edges; and all other harmful surface defects. Each piece shall be in continuous length and shall not contain any joint or weld other than those in the rod before it was drawn.

## 9. SAMPLING AND CRITERIA FOR CONFORMITY

**9.1** Sampling and criteria forconformity shall be as given in Appendix B.

## 10. PACKING

**10.1** Each coil of wire shall be bound securely at four places and suitably packed to avoid damage during transit.

**10.1.1** The inner diameter of each coil shall not exceed 600 mm.

## 11. MARKING

**11.1** Each coil of wire shall be securely tagged with a label suitably marked with the following:

a) Manufacturer's name or trade-mark,
b) Year of manufacture,
c) Coil number, and
d) Weight of coil.

**11.2** Each coil shall be sealed with a lead disc which shall bear the purchaser's acceptance mark. The lead disc shall be perforated parallel to the face so that the wire can be passed through it. The end of the wire shall then be flattened and the disc slipped over the flattened portion and secured by one or two blows with a hammer and stamped.

**11.2.1** The coil may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution ( Certification Marks ) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for comformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors may be obtained from the Indian Standards Institution.

# APPENDIX A

( *Clause* 6.5 )

## MULTIPLIER CONSTANTS FOR CONVERSION OF ELECTRICAL RESISTANCE TO 27°C

| TEMPERATURE AT WHICH RESISTANCE IS MEASURED | MULTIPIER CONSTANT FOR CONVERTING TO 27°C | TEMPERATURE AT WHICH RESISTANCE IS MEASURED | MULTIPLIER CONSTANT FOR CONVERTING TO 27°C |
|---|---|---|---|
| (1) | (2) | (1) | (2) |
| °C | | °C | |
| 5 | 1·1127 | 28 | 0·9953 |
| 6 | 1·1070 | 29 | 0·9909 |
| 7 | 1·1014 | 30 | 0·9864 |
| 8 | 1·0959 | 31 | 0·9819 |
| 9 | 1·0904 | 32 | 0·9775 |
| 10 | 1·0848 | 33 | 0·9732 |
| 11 | 1·0796 | 34 | 0·9688 |
| 12 | 1·0742 | 35 | 0·9645 |
| 13 | 1·0689 | 36 | 0·9602 |
| 14 | 1·0637 | 37 | 0·9560 |
| 15 | 1·0585 | 38 | 0·9516 |
| 16 | 1·0534 | 39 | 0·9472 |
| 17 | 1·0483 | 40 | 0·9430 |
| 18 | 1·0432 | 41 | 0·9384 |
| 19 | 1·0383 | 42 | 0·9339 |
| 20 | 1·0333 | 43 | 0·9296 |
| 21 | 1·0284 | 44 | 0·9251 |
| 22 | 1·0236 | 45 | 0·9209 |
| 23 | 1·0188 | 46 | 0·9165 |
| 24 | 1·0140 | 47 | 0·9122 |
| 25 | 1·0093 | 48 | 0·9077 |
| 26 | 1·0046 | 49 | 0·9033 |
| 27 | 1·0000 | 50 | 0·8989 |

# APPENDIX B

( *Clause* 9.1 )

## SAMPLING AND CRITERIA FOR CONFORMITY

### B-1. LOT

**B-1.1** In any consignment, all the coils of wire of the same grade and diameter, manufactured under essentially similar conditions of manufacture, shall be grouped together to constitute a lot.

**B-1.1.1** Samples shall be taken from each lot and tested for conformity to the standard.

### B-2. SAMPLING

**B-2.1** The number of coils to be taken from a lot shall be according to col 1 and 2 of Table 2. These samples shall be taken at random by using number tables ( *see* IS : 4905-1968* ).

TABLE 2 SCALE OF SAMPLING AND PERMISSIBLE NUMBER OF DEFECTIVES

( *Clauses* B-2.1, B-3.1 *and* B-3.2 )

| No. of Coils in a Lot | No. of Coils for Physical Requirements | Permissible No. of Defective Coils | No. of Tests for Chemical Requirements |
|---|---|---|---|
| Up to 25 | 2 | 0 | 1 |
| 26 to 50 | 3 | 0 | 1 |
| 51 to 150 | 5 | 0 | 2 |
| 151 to 300 | 8 | 1 | 2 |
| 301 and above | 13 | 1 | 2 |

### B-3. PREPARATION OF SAMPLES AND NUMBER OF TESTS

**B-3.1 Tests for Physical Requirements** — From the coils selected from col 1 and 2 of Table 2, adequate length of test piece shall be cut from each end and subjected to physical tests, namely, size, surface condition, tensile, wrapping, coating and resistance tests. A test piece failing to meet any one of the requirements, shall be called a defective. If the number of defectives found is less than or equal to the permissible number of the defectives specified in col 3 of Table 2, the lot shall be considered to have conformed to physical requirements.

---

*Methods for random sampling.

**B-3.2 Tests for Chemical Requirements** — Unless otherwise agreed, the following procedure shall be followed for chemical requirements:

> From those tests pieces which have conformed to physical requirements, further test pieces shall be selected at random according to col 4 of Table 2. These samples shall be tested for all the chemical requirements. If a test piece fails to meet the respective chemical requirement, it shall be called a defective. The lot shall be considered to have conformed to the chemical requirements if all the individual test pieces tested for chemical requirements pass the test.

## B-4. CRITERIA FOR CONFORMITY

**B-4.1** A lot shall be considered to have conformed to the requirements of the specification if **B-3.1** and **B-3.2** are satisfied.

## BUREAU OF INDIAN STANDARDS

***Headquarters*:**
Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002
**Telephones**: 323 0131, 323 3375, 323 9402 Fax :+ 91 011 3234062, 3239399, 3239382
**E - mail** : bis@vsnl.com. **Internet** : http://wwwdel.vsnl.net.in/bis.org

| ***Central Laboratory*** : | ***Telephone*** |
|---|---|
| Plot No. 20/9, Site IV, Sahibabad Industrial Area, Sahibabad 201010 | 77 00 32 |
| ***Regional Offices:*** | |
| Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002 | 323 76 17 |
| *Eastern : 1/14 CIT Scheme VII, V.I.P. Road, Kankurgachi, CALCUTTA 700054 | 337 86 62 |
| Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160022 | 60 38 43 |
| Southern : C.I.T. Campus, IV Cross Road, CHENNAI 600113 | 235 23 15 |
| †Western : Manakalaya, E9, MIDC, Behind Marol Telephone Exchange, Andheri (East), MUMBAI 400093 | 832 92 95 |
| ***Branch Offices:*** | |
| 'Pushpak', Nurmohamed Shaikh Marg, Khanpur, AHMEDABAD 380001 | 550 13 48 |
| ‡Peenya Industrial Area, 1st Stage, Bangalore-Tumkur Road, BANGALORE 560058 | 839 49 55 |
| Commercial-cum-Office Complex, Opp. Dushera Maidan, E-5 Arera Colony, Bittan Market, BHOPAL 462016 | 72 34 52 |
| 62/63, Ganga Nagar, Unit VI, BHUBANESWAR 751001 | 40 36 27 |
| Kalai Kathir Building, 670 Avinashi Road, COIMBATORE 641018 | 21 01 41 |
| Plot No. 43, Sector 16 A, Mathura Road, FARIDABAD 121001 | 28 88 01 |
| Savitri Complex, 116 G.T. Road, GHAZIABAD 201001 | 71 19 98 |
| 53/5 Ward No.29, R.G. Barua Road, 5th By-lane, GUWAHATI 781003 | 54 11 37 |
| 5-8-56C, L.N. Gupta Marg, Nampally Station Road, HYDERABAD 500001 | 320 10 84 |
| E-52, Chitranjan Marg, C- Scheme, JAIPUR 302001 | 37 38 79 |
| 117/418 B, Sarvodaya Nagar, KANPUR 208005 | 21 68 76 |
| Seth Bhawan, 2nd Floor, Behind Leela Cinema, Naval Kishore Road, LUCKNOW 226001 | 21 89 23 |
| NIT Building, Second Floor, Gokulpat Market, NAGPUR 440010 | 52 51 71 |
| Patliputra Industrial Estate, PATNA 800013 | 26 28 08 |
| Institution of Engineers (India) Building, 1332 Shivaji Nagar, PUNE 411005 | 32 36 35 |
| 'Sahajanand House' 3rd Floor, Bhaktinagar Circle, 80 Feet Road, RAJKOT 360002 | 36 85 86 |
| T.C. No. 14/1421, University P. O. Palayam, THIRUVANANTHAPURAM 695034 | 32 21 04 |

---

| | |
|---|---|
| *Sales Office is at 5 Chowringhee Approach, P.O. Princep Street, CALCUTTA 700072 | 27 10 85 |
| †Sales Office is at Novelty Chambers, Grant Road, MUMBAI 400007 | 309 65 28 |
| ‡Sales Office is at 'F' Block, Unity Building, Narashimaraja Square, BANGALORE 560002 | 222 39 71 |

Reprography Unit, BIS, New Delhi, India